incentives to exertion, would perhaps have succumbed to the same amount of disease.

In conclusion, the general views which, with our present knowledge, are to govern the management of pulmonary tuberculosis may be summed up in a few words. The grand ends to be attained are, the removal of the cachexy on which the progress of the disease depends; the consequent arrest of the disease, and the promotion of the processes of restoration. There is no special medication to be pursued for the attainment of these ends; they are to be attained by measures which, in general terms, develop and strengthen the powers of the system. This mode of expression, it is true, in a scientific point of view must be considered rather vague; but in a practical sense it has a meaning sufficiently definite. The measures are hygienic rather than medicinal; but much importance often belongs to the latter. The hygienic measures which are most important are laborious exercise in the open air conjoined with agreeable mental occupation, and, as conducive thereto, frequently change of business, the selection of a more eligible climate, and travelling are desirable, if not necessary; generous diet, and in many if not most instances, the free use of alcoholic stimulants. The medicinal remedies, in addition to those which are simply palliative, are chiefly those of the tonic class, and in this category may be included the analeptic remedy which has of late years had so much celebrity—the *oleum jecoris aselli.*

September, 1857.

ART. III.—*The Vital Statistics of War, as shown by the Official Returns of the British Army During the War with Russia, and by those of the United States Army During the War with Mexico.*[1] By Assistant Surgeon RICHARD H. COOLIDGE, U. S. Army.

WITHIN the last ten years two memorable wars with their brilliant feats of arms, their instances of consummate generalship and of individual heroism, have attracted in a pre-eminent degree the attention of the civilized world. Is it not the province of the medical profession to examine the official records of those wars, to ascertain the amount of sickness and mortality with which they have been attended, and to devise, if possible, some means by which the terrible sacrifice of life consequent upon a state of war may be lessened?

---

[1] Dispatches and Papers relative to the Campaign in Turkey, Asia Minor, and the Crimea, during the War with Russia in 1854–55–56, &c. &c. Compiled and arranged by Captain Sayer, Deputy Assistant Adjutant General, Horse Guards. London, 1857. (Statistics and returns prepared by authority.)

Statistical Report on the Sickness and Mortality in the Army of the United States. Compiled from the records of the Surgeon General's office, and published by authority of the Senate. Washington, 1856.

The war between France, England and Turkey on the one side, and Russia on the other, was distinguished by the greatness of the numerical force engaged, and the vast amount of material employed, as well as by the science, energy, and perseverance displayed on both sides; while that of the United States and Mexico, though carried on with a less imposing military array, was nevertheless characterized by events no less brilliant, and by feats of arms exhibiting no less of perseverance, and of military skill.

The records of military surgery attest that the advance made in military science, and the improvement and multiplications of the means of attack and of defence, have lessened rather than increased the loss of life arising from actual conflicts of arms. It is to be feared, however, that although the progress made in medicine and surgery may, and probably has, lessened the proportion of deaths to the number of sick and wounded, yet that the loss of life from diseases incident to large armies, has not, in the aggregate, been diminished. The application of known principles of hygiene to armies and navies, has, under ordinary circumstances, been attended with the happiest results. Thus, in the British navy, the deaths in "1779 were 1 in 8; in 1811, 1 in 32; and in 1836, 1 in 72." It is, probably, impossible to apply those principles, or to enforce prophylactic measures, as generally and as rigidly in large armies as in fleets, but surely the sanitary condition of troops in the field exhibited in these statistics, not only admits of, but imperatively demands correction.

It is believed that though the circumstances of the respective campaigns in which the armies of England and of the United States were engaged, widely differ, the statistics of both admit of comparison; and that the general results afford material for the serious consideration of all concerned in the formation, discipline, and economy of armies, as well as for those immediately connected with their hospital service.

It is evident that in a comparative analysis of statistics not based upon precise or uniform data, but relating to dissimilar numbers and covering unequal periods of time, much room is afforded for error, and for so stating the results as to make them conform to the opinion of the individual, or, in instances like the present, to render them subservient to national prejudice or pride.

The writer has no other object in view than that of presenting the general vital statistics of those wars as shown by the official returns; and of exhibiting in a clear and concise form the magnitude of those evils of war which, in his opinion, admit of palliation.

The material at command is not such as to admit of the consideration of the diseases of those armies, or of the special causes which led to them; but as the returns embrace the statistics of several kinds of troops engaged in dissimilar operations, the results will, it is believed, give a close approximation to the average loss of health and of life incident to a state of war; and will also show the ratio of such loss consequent upon actual conflicts with the enemy, to that from diseases following the ordinary exposure and hardships of an active campaign.

In order that these statistics may be understood, and receive their true value and nothing more, it is considered advisable to precede them by a summary statement of the principal events of the war with Russia, and of that with Mexico; to point out the leading circumstances affecting the two armies; and to note those things which serve to compensate for the different character of their campaigns, and for the disparity in their relative strength.

The principal events of the war with Russia as connected with the service of the British Army, may be summarily stated as follows: The embarkation of troops from England commenced on the 22d of February, 1854, and the first divisions of the British Army arrived "in the East" in April following. The Allied Armies landed in the Crimea, September 14, 1854, and on the 20th of that month fought the battle of the Alma. The first bombardment of Sebastopol commenced on the 17th October, 1854, from which time until the final assault and capture of that city, September 8, 1855—a period of ten months and twenty-two days—the allied armies were continually engaged in the siege of that place. In addition to the exposure and frequent conflicts with the enemy necessarily attendant upon siege operations, those armies fought five battles. The battle of Balaklava, October 25, 1854; the battle of Inkerman, November 5, 1854; the "first general assault" upon Sebastopol, June 18, 1855; the battle of the Tchernaya, August 16, 1855; and the final assault upon Sebastopol, September 8, 1855.

The declaration of peace was announced from the Foreign Office, London, March 31, 1856.

A portion of the "old," or regular army of the United States, which had been for some months encamped at Corpus Christi, Texas, advanced on the 8th of March, 1846, to the Rio Grande, opposite the Mexican town, Matamoras. On the 25th of April, a detachment from that army was attacked by a large Mexican force. The principal events of the war which immediately followed this act of hostility, may be thus enumerated: The battles of Palo Alto, and of Resaca de la Palma, May 8th and 9th, 1846; siege of Fort Brown, May 4th to 9th, 1846; battle of Monterey, September 21st, 22d, and 23d, 1846; battle of Buena Vista, February 22d and 23d, 1847; siege of Vera Cruz, March 9th to 28th, 1847; battle of Cerro Gordo, April 18th and 19th, 1847; battles of Contreras and Churubusco, August 19th and 20th, 1847; battle of Molino del Rey, September 8th, 1847; battles of Chapultepec and City of Mexico, September 12th, 13th, and 14th, 1847.

The President's proclamation declaring the termination of the war, was announced in orders from the War Department July 6th, 1848.

It appears from the preceding statement of facts, that the actual duration of the two wars was nearly the same; and that in both, a period of about eighteen months elapsed between the first movement of troops towards their respective theatres of war, and the crowning events of those contests, the taking of Sebastopol, and the capture of the City of Mexico.

At the commencement of hostilities, the United States Army present at the seat of war numbered about 3000, being about one-fifth of the total regular (old) force employed during the war.

At the landing in the Crimea, the number of British troops amounted to 26,800, being a little more than one-fourth of the aggregate strength of that regular army during the war.

It is *probable* that with both armies the relative proportion between the *average* numbers actually on duty at the seat of war, to the *aggregate* force employed in each during the whole period of the war, was maintained with some degree of uniformity; but the data to determine this point are wanting. In the tables which are herewith presented, the official figures are strictly adhered to, the losses per cent. being calculated therefrom. As, however, the results of such calculations do not truly represent the relative loss per cent. to the *actual average number* of officers and men in the field, it has been assumed in the last table of the series, that the average force constantly in the field throughout the war, or for the whole period of service, was *one-half* of the aggregate force mustered into service, or employed in the war. As respects the British Army, the writer has no positive means for judging whether this assumption is a fair one, whether it does or does not approximate the true average; but with regard to the regular (old) army of the United States, and to the volunteer force, he believes that it does represent very nearly the true average. The "additional force," known as the "ten new regiments," called into service during the war with Mexico, had probably an average of *two-thirds* of their aggregate numbers actually in the field.

The official returns of the condition of the British troops, from which these statistics have been compiled, cover a period of twenty-five months and six days, commencing February 22d, 1854, and ending April 1st, 1856. As, however, only "the Guards" and three regiments of infantry had embarked from England prior to the 1st of March, the six days in February have been neglected in calculating the ratios of losses sustained, and the term of service has been stated at twenty-five months.

The official statistical tables respecting the "old" or regular army of the United States, which have been used in this paper, cover a period of twenty-six months, from May 1st, 1846, to July 1st, 1848. The statistics of the "additional force," or the "ten new regiments," and of the "volunteer force," are given separately, both for the reason that their terms of service were much less than that of the regular army, and because it is desirable on many accounts to compare the results of different organizations. It is to be particularly observed, that the sole object of this paper being to show the effects of war upon the *health* and *lives* of those engaged therein, the losses set down in the official returns of the British Army under the headings "Prisoners of War," and "Desertions," and in those of the United States Army under "Resignations," "Desertions," and "Discharges by Expiration of Service," are not included in the statistical tables which follow.

Under the "Invalided Home" of the British returns, and the "Discharges for Disability and by Order," of the United States returns, are included all those who from disease or wounds were rendered *non-effective.* The persons thus discharged from the United States Army, were sent to their homes at the public cost, and most of them were pensioned. It is known that the mortality in this class was very great, but there are no data by which to ascertain its actual amount.

The sufferings of the British Army from the severity of the winter in the Crimea, and from cholera, find their counterpart in the exposure of the United States Army to the intense heat and fevers of the Rio Grande and of Vera Cruz, and in the general prevalence of "Mexican Diarrhœa" which proved its severest and most fatal scourge.

With these preliminary and explanatory remarks the tables are submitted.

No. I.—*Table showing the Aggregate Strength of each Army in Officers and Men; the Deaths; and the Numbers rendered Non-effective from all causes.*

FORCES.	Total strength; officers and men, including reinforcements.	Deaths from all causes at the seat of war.	Invalided home (British Army). Discharges for disability and by order (U. S. Army).	Total loss.
BRITISH ARMY.				
Regulars	97,864			
Land Transport Corps .	7,575			
British German Legion .	3,753			
British Swiss Legion .	2,121			
Total . .	111,313	21,097	16,308	37,405
UNITED STATES ARMY.				
Regulars	15,736			
Additional Force . .	11,186			
Volunteers	73,260			
Volunteer General Staff .	272			
Total . .	100,454	12,896	12,252	25,148

In the other tables of this series the statistics of the regular troops of the British Army will alone be given, as the Land Transit Corps did not arrive at the seat of war till the spring of 1855; and the German and Swiss Legions not until the fall of 1855.

No. II.—*Table showing the Loss sustained in consequence of Engagements with the Enemy.*

FORCES.	Total strength officers and men.	Total period of service.	KILLED IN BATTLE.			DIED OF WOUNDS.			TOTAL KILLED AND DIED OF WOUNDS.		
			Officers.	Men.	Total.	Officers.	Men.	Total.	Officers.	Men.	Total.
BRITISH ARMY.		*Mos.*									
Regulars . . .	97,864	25	157	2598	2755	86	1933	2019	243	4531	4774
UNITED STATES ARMY.											
Regulars . . .	15,736	26	41	422	463	22	307	329	63	729	792
Additional Force .	11,186	15	5	62	67	5	71	76	10	133	143
Volunteers . .	73,260	10[1]	46	467	513	0	100	100	46	567	613

FORCES.	LOSS PER CENT.		WOUNDED IN BATTLE.			Proportion of deaths to the number wounded.	Total killed and wounded.	Proportion of killed and wounded to the total strength, officers and men.
	Whole service.	Monthly average.	Officers.	Men.	Total.			
BRITISH ARMY.								
Regulars . . .	4.87	0.19+	515	11,361	11,876	1 in 5.88	14,631	1 in 6.68
UNITED STATES ARMY.								
Regulars . . .	5.03	0.19+	118	1,685	1,803	1 in 5.48	2,266	1 in 6.94
Additional Force .	1.27	0.08	36	236	272	1 in 3.58	339	1 in 33.00
Volunteers . .	0.83	0.08	129	1,189	1,318	1 in 13.18	1,831	1 in 40.01

Having appended a note to this table, explaining the comparatively small loss in battle of the "additional" and volunteer troops, it is proper to direct special attention to the comparatively greater losses from *ordinary* causes sustained by those troops, as shown in the following table. It is believed that the "additional force" had a *greater* number of men constantly in the field, in proportion to their aggregate strength, than either the regulars or volunteers, and that the volunteers had the smallest number in proportion to their aggregate force. The "ratios" in Table III. are therefore too high for the "additional force," and too low for the volunteers.

---

[1] The regiments of volunteers were mustered into service for unequal periods, from three to twelve months. The *average* period of their service is given in this table as officially reported by the Adjutant-General of the Army. As nothing is further from the intention of the compiler than to lead to erroneous conclusions, the reader is desired to bear in mind, while examining this table, that the proportion of volunteers actually engaged in battle was relatively less than that of either the "additional" or regular troops; that their period of service was very much less; and also the fact that the "additional force," as well as the larger portion of the volunteers, were not brought into service till after many of the battles had been fought. The relative loss in battle of these troops was, from these circumstances, of necessity less than that of the regular troops.

No. III.—*Table showing the Number of Deaths from Ordinary or Accidental Causes, and the Numbers "Invalided Home," or Discharged for Disability.*

FORCES.	Total strength, officers and men.	Period of service.	ORDINARY AND ACCIDENTAL DEATHS.				
			Officers.	Men.	Total.	Loss per cent.	
						Per month.	Total.
BRITISH ARMY.							
Regulars . . .	97,864	25	143	15,667	15,810	0.64+	16.15
UNITED STATES ARMY.							
Regulars . . .	15,736	26	49	2,713	2,762	0.67+	17.55
Additional Force . .	11,186	15	36	2,085	2,121	1.26+	18.96
Volunteers . . .	73,260	10	Not stated	6,448	6,448	0.88	8.80

FORCES.	INVALIDED AND DISABLED.			Aggregate loss.	Total loss per cent.	Loss per cent. per month.	Loss per cent. per annum.
	Total officers and men.	Loss per cent.					
		Per month.	Total.				
BRITISH ARMY.							
Regulars . . .	16,050	0.65	16.40	31,860	32.55	1.30	15.60
UNITED STATES ARMY.							
Regulars . . .	2,155	0.53	13.69	4,917	31.24	1.20	14.40
Additional Force . .	881	0.52+	7.87	3,002	26.83	1.79	21.48
Volunteers . . .	9,169	1.25	12.51	15,617	21.31	2.13	25.56

Assuming that in the British army, and in the regular and volunteer troops of the United States, the average number of officers and men actually engaged in the campaigns through the entire period of the war, or of their term of service, was *one-half* of the aggregate number mustered or received into service during the war; and that in the "additional force" this average was *two-thirds* of its aggregate strength (believed to be a near approximation to the true average), we have the following results:—

FORCES.	Term of service. *Mos.*	KILLED IN BATTLE AND DIED OF WOUNDS.		DEATHS: ORDINARY AND ACCIDENTAL.		INVALIDED AND DISABLED.		LOSS PER CENT. FROM ALL THESE CAUSES.	
		Loss per cent.		Loss per cent.		Loss per cent.		Loss per cent.	
		Total.	Annual.	Total.	Annual.	Total.	Annual.	Total.	Annual.
British Army	25	9.75	4.68	32.31	15.48	32.80	15.72	74.86	35.88
U. S. Army	26	10.06	4.56	35.10	16.20	27.38	12.60	72.54	33.36
Additional Force	15	1.91	1.51	28.44	22.68	15.74	25.02	46.09	49.21
Volunteers	10	1.25	1.49	17.60	21.12	25.02	30.02	48.87	52.63

It is possible that the "loss per cent." on the basis *assumed* in the above table may give a higher ratio than the true one. This is more likely to be the case with regard to the British army than with that of the United States;

for although the precise data are not at the command of the writer in either case, he is familiar with the details of the official returns of the one army, and knows little or nothing respecting the records of the other. That the average assumed does approximate somewhat to the true one for the British army, may, with some reason, be inferred from the fact, that the annual loss per cent. in officers and men, calculated upon that basis, approximates the loss sustained by that army in the Peninsular war. In a paper compiled by Mr. Edmunds from returns in the Adjutant-General's office—quoted by Sir George Ballingall in his work on *Military Surgery*—it is stated that, "in the Peninsular army, averaging a strength of 64,227, including officers and men, the annual ratio of mortality, from the 25th December, 1810, to the 25th May, 1813, was *ten* per cent. of the officers and *sixteen* per cent. of the men." On the basis assumed in this table, the annual *mortality* of officers is 9.48 per cent., and that of the men 20.64 per cent.

In stating the average number of volunteers in the field at one-half their aggregate strength, the error, if any, is in favour of the volunteers; for if, as the writer believes, their average force was less than that assumed, the ratio of mortality would be higher. The difference in the loss of life and of health between regular and irregular troops, shown in these tables, is, in the most favourable view, and with every allowance for error in the returns, sufficiently great to render the fact one of national importance.

Since the above was written, the report of the Minister of War to the Emperor of France, respecting the affairs of the Army of the East, has been received. As that report gives the aggregate number of deaths occurring in the army, without designating separately those who were killed in battle or died of wounds, no attempt has been made to incorporate the French statistics in these tables.

The report shows that France sent 309,268 soldiers to the seat of war. Of this number 62,492 died previous to the declaration of peace, March 30, 1856, and 4,564, between that period and the final evacuation of the Crimea, July 5, 1856; making 67,056 deaths. If to this be added the missing, and those lost in "la Sémillante," we have a total loss of 69,229 men. There returned to France 65,069 men, "on leave or on sick leave." This class is *supposed* to correspond with the "Invalided Home" of the British, and the "Discharged for Disability," of the United States returns, and will be so considered in the following table, which is intended to show the actual loss in effective men sustained in these wars, by France, England, and the United States.

ARMY.	Aggregate force.	M'ths in service.	Total died.	Loss p. cent		Total invalided.	Loss p. cent.		Total loss.	Loss p. cent.	
				Total.	Annual.		Total	Annual.		Total.	Annual.
FRENCH . . .	309,268	25	62,492	20.20	9.72	65,069	21.04	10.08	127,561	41.24	19.80
BRITISH . . .	111,313	25	21,097	18.95	9.12	16,308	14.65	6.96	37,405	33.60	16.08
UNITED STATES .											
Regulars . .	15,736	26	3,554	22.58	10.44	2,155	13.69	6.24	5,709	36.27	16.68
Additional Force	11,186	15	2,264	20.23	16.20	881	7.87	6.24	3,145	28.10	22.44
Volunteers and Vol. Staff .	73,532	10	7,078	9.62	11.54	9,216	12.53	15.03	16,294	22.15	26.57
Total, U. S. Army	100,454	..	12,896	12.83	..	12,252	12.19	..	25,148	25.02	..

FORT RILEY, KANSAS TERRITORY, *November*, 1857.

ART. IV.—*Experiments with Bibron's Antidote to the Poison of the Rattlesnake.* By WILLIAM A. HAMMOND, M.D., Assist. Surg. U. S. Army.

SOME four years since, Prince Paul, of Wurtemberg, the celebrated naturalist, communicated to my friend, Mr. De Vesey, the results of some experiments performed before the French Academy of Sciences by Professor Bibron, relative to an antidote to the poison of the rattlesnake. According to Prince Paul, Professor Bibron allowed a rattlesnake to bite him in the lips, cheeks, &c., and, by taking the antidote discovered by him, prevented all alarming symptoms, and, in fact, suffered no inconvenience therefrom.

The antidote in question, as stated by Prince Paul, is prepared according to the following recipe: ℞.—Potassii iodidi gr. iv; hydrarg. chloridi corros. gr. ij; bromini ʒv.—M. Ten drops of this mixture diluted with a tablespoonful or two of wine or brandy constitute a dose, to be repeated if necessary. It must be kept in glass-stoppered vials well secured.

Prince Paul forwarded a small quantity of the above mixture to Mr. De Vesey, who used it successfully in the cases of two men bitten by rattlesnakes near his residence in Iowa.

During a recent expedition to the Rocky Mountains, I had several opportunities of testing its efficacy, and, since my return, have performed additional experiments with it. The results have been, upon the whole, exceedingly satisfactory, and I think that when taken in time it may be entirely depended upon in the poisonous wounds of the rattlesnake, and, perhaps, also in those of other venomous serpents.

1*st Experiment.*—Heinrich Brandt, Acting Hospital Steward, was bitten, on the 2d of July, 1857, in the index finger of the right hand by a large rattlesnake (*crotalus confluentus*), which he was in the act of putting into a jar for preservation. The snake inflicted a very deep wound, and hung by his